Table 2-2
Projects needed for implementing the WMI[1]
and other regional and watershed-specific initiatives
("Regional Projects List")

PROJECTS, BY CATEGORY

1) **TMDL Implementation**
    (a) Conduct water quality and watershed model simulations to validate and/or revise load allocations and evaluate compliance with TMDLs.
    (b) Where groundwater/ surface water interactions account for contaminant loadings to the watershed, create models to simulate these interactions to assess potential remediation strategies.
    (c) Identify BMPs for nutrient and sediment reduction/removal.
    (d) Revise nutrient water quality objectives[2].
    (e) Evaluate in-lake water quality management strategies and management practices.
    (f) Education/outreach for reducing polluted runoff from urban, agricultural, CAFO and forested areas.
    (g) Education/outreach for controlling invasive species.
    (h) Classify and assess condition of "unimproved" creeks and streams.
    (i) Run water quality model simulations.
    (j) Review / revision of water quality objectives[2]
    (k) Implement BMPs and NPS management measures.
    (l) Water quality monitoring (biological and geochemical).
    (m) Water quality model setup and update – for watersheds and for receiving waters.
    (n) Develop a pollutant budget model that can be used to track water quality changes over time.
    (o) REC-1 BU assessment[2]
    (p) Food web and egg studies for bioaccumulative compounds.
    (q) Identification of sensitive/indicator species for specific contaminants.

2) **TMDL development**
    (a) Compile data (GIS, water quality, and other) and separate by watershed management areas.
    (b) Evaluate impacts of 303(d) listed constituents on beneficial uses.
    (c) Evaluate data used in placing water body on 303(d) list (what water quality standards were violated?)
    (d) Evaluate where (temporally and spatially) in TMDL-candidate water body beneficial uses are supported or impaired.

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[1] This list is not a ranked list of regional priorities
[2] Ranked on Basin Plan 2002 Triennial Review priority list

Table 2-2: Regional Priority List   **Page 2**

(e) Develop and update a dynamic water quality model.
(f) Conduct water quality monitoring –chemical, biological and geochemical (including sediment, water column, and suspended solids).

3) **Wetlands/riparian/stream restoration and preservation**
(a) Support acquisition of wetlands and other areas that support WARM, WILD, EST, SPWN, BIOL, COLD and REC1 and/orREC2 beneficial uses.
(b) Provide for identification and delineation of, and special protection/ preservation for, vernal pools.
(c) Support stream and bank erosion stabilization projects that use bioengineered solutions.
(d) Support creation of riparian buffers.
(e) Conduct stream classification and assessment studies.
(f) Establish/identify reference reaches of surface waters.
(g) Develop regional hydrologic curves.
(h) Produce / collaborate in production of a stream restoration handbook.
(i) Assess condition of mitigation banks and classify them.
(j) Daylight fully enclosed drainage channels and similar surface waters.
(k) Remove concrete channel linings.
(l) Preserve and protect remaining unimproved stream segments.
(m)Encourage environmental easement acquisitions.
(n) Discourage development on flood plains.
(o) Where development in a flood plain is already occurring, encourage the use of bioengineering techniques to stabilize and restore water courses to minimize potential destabilization from the loss of the flood plain (erosion of stream banks and accelerated downcutting), and to reduce impacts from increased dry weather flows from urban development and flooding.

4) **Habitat purchase and protection**
(a) Preserve and protect endangered and threatened species (plant *and* animal species) habitat, including wildlife corridors.
(b) Remove barriers to fish spawning.
(c) Improve fish habitat.
(d) Preserve and protect designated Areas of Special Biological Significance (ASBS) and Critical Coastal Areas (CCA).
(e) Establish, preserve and protect wildlife reserves and refuges.
(f) Preserve and protect riparian buffers and "unimproved" streams.
(g) Preserve and protect important migratory waterfowl lay-over sites.

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5) **BMP and NPS management measure (MM) implementation focused on source control**
   (a) Increase emphasis on BMPs and NPS MMs for control of upper watershed sources of NPS pollutants.
   (b) Develop and/or implement BMPs and MMs for nutrient and sediment reduction/removal.
   (c) Utilize physical/chemical treatment as BMPs and MMs, e.g., use of PAM.
   (d) Support water conservation measures.
   (e) Develop and implement BMPs and MMs for reducing and/or treating recycled water runoff.
   (f) Develop and/or implement BMPs for toxicity reduction.
   (g) Education/implementation of Integrated Pest Management (IPM) practices.
   (h) Develop and/or implement pet waste / good housekeeping BMPs.
   (i) Develop and implement rates for fertilizer / manure applications to cropland.
   (j) Deliver BMP and NPS MM education and outreach focused on locally important NPS issues to targeted audiences.

6) **GIS/Database management**
   (a) Create and support two full time Regional Board staff positions – Database Manager and GIS Analyst.
   (b) Input resource monitoring and compliance monitoring data into STORET.
   (c) Create format for batch updates.
   (d) Provide STORET training for interested staff.
   (e) Create a geodatabase.
   (f) Purchase / acquire software for image manipulation (aerial and satellite imagery), 3D representations (e.g., TIN distribution), etc.
   (g) Upgrade to ArcGIS (provided there is a staff GIS Analyst)
   (h) Acquire GIS data layers.
   (i) Create scripts to automate GIS functions.
   (j) Provide introductory GIS training for all technical staff, and intermediate GIS training for interested staff.
   (k) STORET existing data.
   (l) STORET setup to input the existing data.
   (m) Input all monitoring data to study the spatial and temporal trend of water quality in the entire region.

7) **Wastewater system infrastructure upgrades region-wide.**
   Support efforts to upgrade and modernize sewage collection and treatment systems.

Table 2-2: Regional Priority List   **Page 4**

8) **Connection of septic tank discharges to sewer systems**
   Connect onsite sewage disposal systems to regional sewage collection systems in areas with known or suspected water quality impairment related to use of such systems, particularly in areas close to surface waters or with perched or regionally shallow groundwater.

9) **Support stakeholder watershed planning groups and development of watershed management plans, including watershed education.**

10) **Invasive species management**
    (a) Eradicate Eurasian milfoil (*Myriophyllum spicatum*) in the Big Bear WMA.
    (b) Eradicate *Arundo donax* region-wide.
    (c) Eradicate *Caulerpa taxifolia* through education, prevention and removal in coastal lagoons, estuaries, harbors and bays.
    (d) Eradicate tamarisk (*Tamarix reamosissima*, *T. chinensis*, and hybrids) throughout the watershed.

11) **Referenced sites/biological indices**
    (a) Conduct regional surveys to nominate and establish sites that can be referenced for setting / enforcing water quality standards, etc. These "referenced sites" will be stream segments, reaches of lakes or estuaries, ocean water areas, etc., where water quality, beneficial uses and the prevailing ecosystem have not been severely disturbed by human activities. (An example of a potential reference stream is El Morro Creek, Crystal Cove State Park.)
    (b) Conduct water quality monitoring and bioassessment of these referenced sites, to establish benchmarks for restoration efforts, setting / enforcing standards, etc.
    (c) Develop biocriteria for each aquatic life use for each water body class (see Module 11 of USEPA's Water Quality Standards Academy workbook)
    (d) Establish impacts of pollutants on beneficial uses.

12) **Regional monitoring and assessment**
    (a) Conduct stream classification and assessment inventories (of bed / bank erosion / stability, diversity and condition of species present, riparian community, etc.).
    (b) Gather GIS data pertaining to hydrology (storm drains, concrete-lined portions of channels, etc.).
    (c) Determine the prevalence of dissolved oxygen deficiency in surface waters.
    (e) Conduct water quality modeling and monitoring to analyze / validate the source, transport, and fate of pollutants.
    (f) Research rapid indicators of bacterial contamination, toxicity, etc.

13) Citizen monitoring
- (a) Conduct stream classification and assessment inventories.
- (b) Collect water quality monitoring samples.
- (c) Collect observational water quality data, such as beneficial use occurrence and assessment.
- (d) Assess effectiveness of BMPs implementing pollution prevention, source control and source reduction.
- (e) Participate in invasive species monitoring and prevention programs.

14) Groundwater resource protection
- (a) Groundwater model for the entire Santa Ana Basin as well as for each groundwater subbasin (subbasins are proposed to be redesignated as "management zones")
- (b) Develop and implement a regional groundwater monitoring program
- (c) Protection of groundwater recharge areas
- (d) Protection of groundwater sources supporting ephemeral streams, meadows and vernal pools.
- (e) Groundwater management plans for each groundwater subbasin (management zone).
- (f) Public outreach and education on the linkage between groundwater quality and surface water quality.
- (g) Plan and construct desalters and related peripheral facilities.
- (h) Plan and construct wellhead treatment facilities for removal of perchlorate from groundwater produced by municipal supply wells.

PROJECTS, BY WATERSHED
(Numbers refer to the Regional Projects List, above)

A. All Watersheds
1. Acquire GIS data to assist in implementation and evaluation of BMPs and NPS MMs
2. Acquire GIS data to assist in evaluation of TMDL compliance (RPL 1, 3, 4, 5, 6, 10, 12)
3. Waste management practices for CAFO operators (RPL 1,13,14)
4. Studies evaluating sources of organochlorine and hydrocarbon pollutants, including air deposition and groundwater. (RPL 2)
5. Workshops to educate land developers about state-of-the-art water quality mitigation practices, systems and devices for new development. (RPL 13)
6. Wetlands management projects that are consistent with Southern California Wetlands Recovery Project goals and objectives.
7. Research and develop rapid indicators for water quality pollutants, e.g., pathogens, bacterial indicators, toxicity.
8. Assess SARWQCB's GIS needs and identify priority tasks for GIS development, to include data, hardware and software acquisition, data

manipulation, metadata creation, GIS database creation, and GIS training. (RPL 6)

9. Create a pilot GIS project based on the initial needs assessment of SARWQCB. This could be a watershed analysis that could include at spatial and temporal changes in water quality and track any improvements in water quality through water quality programs such as TMDLs, NPS, stormwater, etc.; changes in land use patterns and the effect of these changes on water quality; assessment of BMPs used for TMDL implementation and their effect on water quality improvements; assessment of habitat for wetlands protection, restoration, creation; assessment of stream channel erosion and restoration potential; initial selection of potential referenced sites / areas for biocriteria, nutrient, etc. (RPL 1, 2, 3, 4, 5, 6, 11, 12).

10. Continue expanding GIS pilot project with other items deemed necessary by SARWQCB after initial pilot project creation. (RPL 1, 2, 3, 4, 5, 6, 11, 12)

11. Facilitate coordination of local grass-roots watershed management groups and environmental interest groups among themselves and the Regional Board, as a way of furthering the goals of the region's and State's watershed management initiative. (RPL 9)

12. Remove concrete linings from flood control channels and restore beneficial uses, such as WILD, WARM, GWR, REC2 and/or REC1, of these channels. (RPL 3)

13. "Daylight" fully enclosed drainage channels and streams, and restore beneficial uses, such as WILD, WARM, GWR, REC2 and/or REC1, of these channels. (RPL 3)

14. Restore beneficial uses to surface water streams through the application of the principles of geomorphology. (RPL 3,4,10, 13)

15. Restore, rehabilitate, preserve and maintain riparian buffers along the Santa Ana River and its tribuatries. (RPL 3,4,10, 13)

16. Support involvement of stakeholder groups participating in the implementation of the 2002 Basin Plan Triennial Review work plan.

17. Provide wellhead treatment for removal of perchlorate in water produced by municipal supply wells. (RPL 14)

B. Big Bear Lake Watershed

18. Revise nutrient water quality objectives for Big Bear Lake (BBL) (RPL 1, 11, 12) [Big Bear WMA]

19. Perform model simulations for nutrients, sediment, and macrophytes in BBL and its watershed (RPL categories 1, 12) [Big Bear WMA]

20. Implement BMPs to reduce sediment and nutrient loading into and within BBL (RPL 1, 3, 4, 5, 10, 13) [Big Bear WMA]

21. Utilize volunteer monitors for stream classification and assessments of creeks within the BBL watershed (RPL 1, 3, 4, 5, 11, 12, 13) [Big Bear WMA]

22. Identify stream candidates for referenced reach(es) within this watershed (RPL 1, 3, 5, 11, 12, 13) [Big Bear WMA]
23. Restore beneficial species of plants within BBL (RPL 1, 10) [Big Bear WMA]
24. Evaluate in-lake water quality management strategies (RPL 1, 5, 10) [Big Bear WMA]
25. Protect / conservation / restore Shay Meadows through purchase, restrictive easements, etc.(RPL 3,4)(Big Bear WMA)

*See **A. All Watersheds** for additional projects*

C. Newport Basin, Newport Coast, Anaheim Bay / Huntington Harbour / Bolsa Chica Watersheds
26. Develop dissolved oxygen water quality objectives for Newport Bay (RPL categories 1, 11, and 12) [Newport Basin WMA]
27. Perform model simulations for nutrients, algae, and oxygen in Newport Bay (RPL categories 1, and 12) [Newport Basin WMA].
28. Implement BMPs to remove nitrogen and selenium from groundwater (as well as other sources) in the Newport Bay watershed, specifically one project in Peters Canyon Channel, and one project in Reach 2 of San Diego Creek (RPL categories 1 and 5). [Newport Basin WMA]
29. Implement BMPs to remove nitrogen from agricultural sources in the Newport Bay watershed (RPL categories 1 and 5). [Newport Basin WMA]
30. Design and carry out an urban runoff fecal coliform source identification plan for the Newport Bay Fecal TMDL [Newport Basin WMA]
31. Design and implement urban runoff fecal coliform source control measures for the Newport Bay Fecal TMDL [Newport Basin WMA]
32. Design and carry out a natural fecal coliform sources identification plan for the Newport Bay Fecal TMDL [Newport Basin WMA]
33. Design and implement a natural fecal coliform sources control plan for the Newport Bay Fecal TMDL [Newport Basin WMA]
34. Conduct Newport Bay vessel waste studies (continue recent efforts, with the potential to add additional sites and include sediment and barnacles). [Newport Basin WMA]
35. Conduct studies of vessel waste pumpout stations [Newport Basin WMA] & [Anaheim Bay/Huntington Habour/Bolsa Chica WMA]
36. Newport Dunes water quality, biota and sediment monitoring [Newport Basin WMA].
37. Baywide water quality, biota and sediment monitoring [Newport Basin WMA]
38. Projects that focus on comparisons of traditional pathogen indicator assays and human virus / coliphage analyses. [Newport Basin WMA]
39. Develop and implement management plans that specify practices to reduce sediment and chemical pollutant loadings from row crops, nurseries and/or citrus / avocado orchards in the Newport Bay Watershed. (RPL 1). [Newport Bay Watershed]

Table 2-2: Regional Priority List   **Page 8**

40. Rigorous study to investigate bioaccumulation of organochlorine compounds and selenium in San Diego Creek and Upper/Lower Newport Bay at multiple trophic levels, and develop site-specific biota-sediment accumulation factors.(RPL 2) [Newport Basin WMA]
41. Study designed to evaluate potential pollutant loadings from agriculture in the Newport Bay watershed. Study would screen surface soils to assess current concentrations of OC compounds, soil texture, and soil TOC as predictors of future pollutant loadings (RPL 2) [Newport Basin WMA]
42. Buck Gully restoration [Newport Coast WMA]
43. Serrano Creek preservation, restoration and revegetation ([Newport Basin WMA]
44. Borrego Creek preservation, restoration and revegetation [Newport Basin WMA]
45. Implementation of NPS MMs in the development of The Great Park, El Toro [Newport Bay Watershed]
46. Creation of areas that support WILD and WARM beneficial use areas in the development of The Great Park, El Toro [Newport Bay Watershed]
47. Use development of The Great Park, El Toro to leverage opportunities to "daylight" fully enclosed channels and to initiate restoration efforts on Agua Chinon and Bee Canyon channels. (RPL 3) [Newport Basin WMA].
48. Remove and relocate sewer line beneath the entrance to the Anaheim Bay National Wildlife Refuge [Anaheim Bay/Huntington Harbor/Bolsa Chica WMA]
49. Repair/upgrade/install vessel waste pumpout stations in Huntington Harbour [Anaheim Bay/Huntington Harbor/Bolsa Chica WMA]
50. Repair/upgrade/install vessel waste pumpout stations in Newport Bay [Newport Basin WMA]
51. Determine depth of pollution / contamination in the Rhine Channel [Newport Basin WMA].
52. Assess remedial options for cleanup of the Rhine Channel to meet TMDLs [Newport Basin WMA].
53. Biological and geochemical investigation of the UCI portion of the San Joaquin Marsh for selenium. [Newport Basin WMA]
54. Egg studies for presence of selenium and other bioaccumulative compounds in both the San Joaquin Marsh and Newport Bay areas (target live eggs for non-T&E species and unhatched, nonviable eggs for T&E species such as the Brown Pelican, Least Tern, and Light-footed Clapper Rail). [Newport Basin WMA]
55. Identification and assessment of remedial options for selenium removal from groundwater and surface water in the Peters Canyon Wash area of San Diego Creek (Swamp of the Frogs area). [Newport Basin WMA]
56. Assessment and modeling of long term impacts of Sediment TMDL, MS4 Permit and BMPs, and USACOE dredging on aggradation/degradation of Newport Bay (are we going from a sediment-heavy system to a sediment-starved system?) and beaches – both up-coast and down-coast as well as intra-bay impacts. [Newport Basin WMA]

Table 2-2: Regional Priority List   **Page 9**

*See **A. All Watersheds** for additional projects*

D. San Jacinto River Watershed
57. Develop nutrient water quality objectives for Lake Elsinore, Canyon Lake and San Jacinto River (RPL 1, 11, 12).
58. Update model simulations for nutrients and pathogens in the San Jacinto River Watershed. (RPL 1).
59. Monitor and track manure application to cropland in SJR watershed. (RPL 1,5)
60. Implement BMPs to prevent fertilizer/manure over-application. (RPL 1, 5)
61. Restore SJR near Mystic Lake and enhance the riparian habitats on CDFG properties (RPL 1,4)
62. Extend regional sewers to the south shore of Lake Elsinore and Quail Valley, and abandon existing septic tank discharges in these areas (RPL 1,8)
63. Implement recommended lake management practices (RP1)]
64. Provide phosphorus removal treatment for all tertiary effluent proposed to be discharged into Lake Elsinore (RPL 1)
65. Nutrient Mass Balance Study for Lake Elsinore/San Jacinto Watershed (RPL 1, 12)
66. Support work of the San Jacinto River Watershed Council (RPL 13)
67. SJR Watershed citizen monitoring program (RPL 1,13) [San Jacinto Watershed]
68. Preserve existing "unimproved" waterways, specifically reaches of the San Jacinto River, by protecting the natural condition of these reaches and establishing adequate buffers.
69. Plan and construct desalters and related peripheral facilities, including pipelines, in groundwater subbasins impacted by excessive TDS concentrations resulting from historic resource and land use practices. (RPL 14).
70. Conduct dynamic water quality models for Lake Elsinore and Canyon Lake to simulate and predict the impacts of activities in the SJR watershed, and in-lake treatment technology on the in-lake water quality, and the beneficial uses.

*See **A. All Watersheds** for additional projects*

E. Upper Santa Ana River Watershed
71. Connect Reche Canyon Mobile Home Park, Colton, to local sewer system (RPL 8, 14)]
72. Arundo and tamarisk removal along the Santa Ana River and its reaches and tributaries.
73. Support and participate in Team Arundo.
74. Restoration efforts focused on a stream called "Spring Brook" that flows under Market Street and into Lake Evans (at Fairmont Park), Riverside.

This creek is identified on early 1900s soil survey maps, so it is likely a natural stream and not merely a flood control channel. This creek is not concrete-lined where it discharges into the lake, a tributary of the Santa Ana River.

75. Remove concrete linings from flood control channels, such as sections of Temescal Creek (upstream of Prado wetlands), San Sevaine Creek (from the foothills of the San Gabriel Mountains downstream), and Sunnyslope Drain (upstream from the Louis Rubidoux nature center). (This channel provides spawning habitat for the endangered Santa Ana Sucker.)

76. Provide desalters and related peripheral facilities, including pipelines, in groundwater subbasins impacted by excessive TDS concentrations resulting from historic resource and land use practices (RPL 14)

77. Provide wellhead treatment for removal of perchlorate in water produced by municipal supply wells. (RPL 14)

*See **A. All Watersheds** for additional projects*

F. Lower Santa Ana River Watershed

78. The watershed of Fremont Canyon, tributary to Santiago Creek in Orange County's Santa Ana Mountains, is among the few remaining relatively pristine watersheds in Orange County (according to a Nature Conservancy publication). This watershed could potentially be evaluated as a reference site. (RPL 11)